

## **HIV/AIDS Infections**

### Summary of Methods and Data for Estimate of Costs of Illness

- |  |                             |
|--|-----------------------------|
| 1. Estimated Total Economic Cost   | \$28.9 billion              |
| Estimated Direct Cost  | \$13.4 billion <sup>2</sup> |
| Estimated Indirect Cost  | \$15.5 billion              |
| Reference Year   | 1999 <sup>3</sup>           |
| Office Providing the Estimate  | OAR <sup>4</sup>            |
|  |                             |
| Direct Costs Include: Other related nonhealth costs  | No                          |
| Indirect Costs Include:  |                             |
| Mortality costs  | \$18.4 billion              |
| Morbidity costs: Lost workdays of the patient  | \$0.8 billion               |
| Morbidity costs: Reduced productivity of the patient   | Not Available               |
| Lost earnings of unpaid care givers  | Not Available               |
| Other related nonhealth costs  | Not Available               |
| Interest Rate Used to Discount Out-Year Costs  | 3%                          |
| 2. Category code(s) from the International Classification of Diseases, 9th Revision, Clinical Modification, (ICD9-CM) for all diseases whose costs are included in this estimate:  |                             |
|  | 042.x    044.x    795.71    |
|  | 043.x    795.8    V08.x     |
| 3. Estimate Includes Costs:  |                             |
| Of related conditions beyond primary, strictly coded ICD-9-CM category   | Not Available               |
| Attributable to the subject disease as a secondary diagnosis   | Not Available               |
| Of conditions for which the subject disease is an underlying cause   | Yes                         |
| 4. Population Base for Cost Estimate (Total U.S. pop. or other)  | Total U.S. pop.             |
| 5. Annual (prevalence model) or Lifetime (incidence model) Cost:   | Annual                      |
| 6. Perspective of Cost Estimate (Total society, Federal budget, or Other)  | Total Society               |
| 7. Approach to Estimation of Indirect Costs  |                             |
| Indirect costs associated with morbidity were calculated by estimating the number of days of productivity lost to illness in 1999, based on both published and unpublished data. Indirect costs associated with mortality were calculated by multiplying the most recent number of AIDS deaths (from CDC, by age category) by an estimate of future lost earnings, discounted by 3% ). Age-specific productivity measures were based on calculations for 1990 by Haddix et al., adjusted for increases in earnings through 1999. |                             |
| 8. <u>Source of Cost Estimate:</u> (Reference published or unpublished report, or address and  |                             |

<sup>2</sup>The difference between the direct cost estimate in this report card and direct cost estimates included in previous versions of this report (reference year 1992) reflect estimated increases in the number of individuals with HIV infection who are receiving treatment as well as the cost of that treatment, especially the cost of highly-active anti-retroviral therapy (HAART), which was introduced in 1996. The differences in this estimate and those based directly on the HCSUS study (Bozette et al.) reflects the same factors, as well as individuals not included in the sampling frame of the HCSUS study.

<sup>3</sup>The estimate is expressed in 1999 dollars, based upon 1996 direct cost data from HCSUS and recent published costs of therapy; the number of persons in care for HIV infection in 1999, stratified by degree of illness, was projected from 1996 HCSUS and CDC data.

<sup>4</sup>The "OAR" is the Office of AIDS Research, National Institutes of Health.

telephone of person/office responsible for estimate)

Stoto, M. and Goldman, A., 1999. "Cost of Illness Estimate: HIV/AIDS." Unpublished report, The George Washington University School of Public Health and Health Services, Department of Epidemiology and Biostatistics.

9. Other Indicators of burden of disease:

**International Pandemic**--It should be noted that estimates of costs of illness spent in the U.S. do not adequately reflect the global burden of disease. HIV has infected more than 50 million people around the world. AIDS already has killed more than 16 million people, surpassing tuberculosis and malaria as the leading infectious cause of death worldwide, according to recent data released by the Joint United Nations Programme on HIV/AIDS (UNAIDS) and the World Health Organization (WHO). In 1999 alone, a record 2.6 million people have died -- more than in any year. HIV/AIDS has reversed decades of progress from important public health efforts to immunize children, control diseases, and improve nutrition. AIDS is lowering life expectancy and significantly affecting international businesses. Globally, HIV infection ranks 4<sup>th</sup> among all diseases as the cause of disability adjusted life years (DALY) lost. The Secretary-General of the United Nations has stated that AIDS is having an impact on the gross domestic product in some countries. The micro-economic effects of absenteeism, decline in a skilled workforce, and payments for sickness and death benefits in the developing world will lead to macro-economic effects worldwide.

The Exploding Global HIV/AIDS Pandemic				
Group	People Newly Infected in 1999	People Living with HIV/AIDS	AIDS Deaths in 1999	Total AIDS Deaths
Adults	5.0 Million	32.4 Million	2.1 Million	12.7 Million
<i>Women</i>	<i>2.3 Million</i>	<i>14.8 Million</i>	<i>1.1 Million</i>	<i>6.2 Million</i>
Children	570,000	1.2 Million	470,000	3.6 Million
Total	5.6 Million	33.6 Million	2.6 Million	16.3 Million

The impact on developing nations is staggering, with even greater potential disaster to come. Africa has been the epicenter of HIV/AIDS globally and continues to carry the largest disease burden, with 70 percent of people living with AIDS worldwide, 83 percent of global AIDS deaths, and 95 percent of global AIDS orphans. AIDS accounts for almost 17% of DALYs lost due to all diseases in Africa--far more than any other infectious or non-infectious disease. The coexistence of other endemic diseases widely prevalent in developing countries, such as respiratory and gastrointestinal infections, complicate treatment and pose additional problems in caring for HIV-infected individuals. Of particular note is the parallel epidemic of tuberculosis in the developing world.

**Shifting U.S. Demographics**--In the United States, the nature of the epidemic continues to evolve. In general, the incidence of AIDS cases has declined overall, which can be attributed largely to expanded use of new antiretroviral therapies that prevent progression of HIV infection

to AIDS. Although the death rate from AIDS is declining, HIV infection rates continue to climb in a number of subpopulation groups, such as women, racial and ethnic minorities, people over 50 years of age, and those with addictive disorders, foreboding an even greater epidemic ahead. While the epidemic has stabilized among white gay men overall, recent reports indicate increasing numbers of new infections among young homosexual men.

As a result of these dynamics, more Americans are living with HIV infection than ever before. The Centers for Disease Control and Prevention (CDC) estimate that between 700,000 and 900,000 Americans are currently infected with HIV. Once again, the demographics show that racial and ethnic minorities are more heavily affected. Prevalence of AIDS is higher among African Americans and Hispanics, who account for 45 percent and 20 percent, respectively, of all persons diagnosed with AIDS during 1998. This disparity is even more striking among women, with minorities accounting for 82 percent of AIDS cases.

**Infectious vs. Non-infectious Disease**--The transmissible nature of HIV makes it radically different from non-transmissible diseases such as heart disease and cancer. The transmissibility of HIV--between individuals and across borders and populations--is what most defines the global pandemic and makes it imperative that the U.S. help address prevention and treatment needs worldwide. The transmissibility of the infection means that there is the potential for unlimited global spread. But it also means that, with the development of appropriate biomedical and behavioral interventions, there is the possibility for dramatic reductions in new infections--and ultimate control of the pandemic--in a way that will never be possible for noninfectious diseases.

#### 10. Commentary

A number of published and unpublished sources of data were used in calculating the cost estimates, including unpublished data from the HIV Cost and Services Utilization Study (HCSUS) (funded through a cooperative agreement between the Agency for Health Care Policy and Research [AHCPR] and the RAND Corporation). NIH contributed funding to the study.

#### **Direct Cost Calculation**

Direct costs are calculated on the basis of actual costs of treatment, as measured by the HCSUS study (Bozette, *et al.*, 1998), extrapolated on the basis of CDC data and expert judgment. The number of persons in treatment for HIV/AIDS was calculated from HCSUS baseline data for a two month sample of persons seeking care for HIV/AIDS in early 1996, an estimated 231,400 to 300,000 individuals. Based on HCSUS information concerning treatment-seeking, this number was extrapolated to an estimated 400,000 individuals receiving care during all of 1996. Including an additional 8 percent that CDC data suggest are not covered by the HCSUS sampling frame and using CDC data on the rate of increase between 1996 and 1998 in numbers of individuals with HIV/AIDS, the estimated number of individuals receiving care for HIV/AIDS in 1999 is 621,894.

This number was then stratified by degree of illness by using a biological marker (CD4 cell count), assuming a similar distribution to the HCSUS sample data and that those new to care were less ill (higher CD4 count). To the HCSUS data for direct costs for each CD4 category was

added the net additional cost of recently-approved highly active antiretroviral therapy (HAART) for that category, based on PHS treatment guidelines (\$5,000-10,000 per person). These numbers were then multiplied by the population estimates for each CD4 category to calculate the total direct cost.

## References

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